ENHANCED INFLUENZA SURVEILLANCE FOR H5N1 & SEASONAL INFLUENZA IN EAST JAKARTA DISTRICT, INDONESIA

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2012
BACKGROUND

• Avian Influenza H5N1:
  – The avian influenza A (H5N1) virus remains a significant threat due to its pandemic potential.
  – In Indonesia, high numbers of human AI confirmed cases. As of May 2012, 189 cases, 157 deaths (CFR 83%).

• Seasonal Influenza:
  – Global public health importance: infects > 3 million people globally, with approximately 250,000 to 500,000 deaths per year.
  – Seasonality and disease burden of influenza is less well understood in tropical countries such as Indonesia.
  – Better understanding of the epidemiology of seasonal influenza and associated disease burden will inform public health policy, including potential use of influenza vaccine, and pandemic preparedness strategies.
To describe the epidemiology of human H5N1 cases and other influenza virus infections through sentinel-based surveillance in East Jakarta District.
SPECIFIC OBJECTIVES

1. To determine the frequency of infection with A(H5N1) virus and other influenza viruses amongst outpatients with influenza-like illness (ILI) & hospitalized patients with severe acute respiratory infection (SARI).

2. To describe the epidemiology and clinical characteristics of cases with A(H5N1) virus and other influenza virus infections.

3. To assess an integrated epidemiology and virology enhanced sentinel-based surveillance strategy for early H5N1 case finding in out-patient and hospital settings.

4. To establish estimates of seasonal influenza disease burden in an urban setting in Indonesia.
EAST JAKARTA DISTRICT

• One of five districts in Jakarta Province.
• Population 2.6 million, urban area.
• Potential high risk area for avian-to-human H5N1 virus transmission.
  – Major entry point for poultry shipments into Jakarta.
  – 63% of Jakarta’s poultry collector yards.
  – 79% of Jakarta’s slaughter houses.
  – 37% of Jakarta’s live bird markets.
  – High prevalence of H5N1 virus among poultry.
  – Since 2005, 12 human cases of H5N1 virus infection were detected in this district.
SENTINEL SITES

SARI - 6 Hospitals
(3 Public, 3 Private):
1. RSUD Budhi Asih
2. RSUD Ps. Rebo
3. RS Harapan Bunda
4. RS Haji Pondok Gede
5. RS Islam Pondok Kopi
6. RSUP Persahabatan

ILI - 4 Sub-district Community Health Centers (Puskesmas):
1. PKC Matraman
2. PKC Kramat Jati
3. PKC Pulogadung
4. PKC Duren Sawit
SURVEILLANCE TEAM AT SENTINEL SITES

- Surveillance physician
  - Manage case finding
  - Site coordinator
- Surveillance nurse
  - Identify cases (active case finding)
  - Fill in case report forms
- Laboratory staff
  - Collect, pack and ship samples
- Medical records staff
  - Report data
  - Include total number of clinic visits or admissions
SURVEILLANCE ACTIVITY

• Surveillance conducted everyday in 6 hospitals and weekdays in 4 health centers.

• Using WHO case definitions for ILI and SARI.

• Nasal and throat swabs collected from all ILI & SARI patients.

• All samples tested for influenza by rt RT-PCR daily.

• Specimens positive for influenza A are subtyped for seasonal influenza subtypes (H1 seasonal, H1N1-2009, H3) and for H5.

• Data Collection: Interview using case forms designed to assess exposures.

• Data Management: Data reporting using online system – a designated website for East Jakarta routine surveillance.
CASE DEFINITIONS

- **Influenza-like illness (ILI):**
  - Used for outpatients
  - Measured fever (≥38°C) + cough or sore throat

- **Severe acute respiratory infection (SARI):**
  - **Inpatients aged ≥5 years:** Measured fever (≥38°C) or subjective fever + cough or sore throat or shortness of breath
  - **Inpatients aged <5 years:** WHO definition for pneumonia or severe pneumonia

- **Suspect H5N1 infection:**
  - WHO definition applied
  - Includes both clinical and exposure components.
H5N1 SUSPECT CASE DEFINITION

- Temperature >38°C AND
- At least one of the following:
  - Cough
  - Sore throat
  - Shortness of breath
  - Rhinorrhea

AND one of the following:

- History of close contact with a suspect/probable/confirmed human case of H5N1 virus infection within seven days of onset of clinical symptoms, defined as taking care of, speaking or touching within 1 meter distance.
- Close contact with poultry (within seven days of onset of clinical symptoms) which is defined as:
  - Performing activities like slaughtering, handling, plucking or cooking poultry OR
  - Contact with live poultry or the carcass or feces of poultry or raw poultry products in an area with reported avian influenza in poultry or human cases in the last month OR
  - History of consuming raw/not completely cooked poultry products in an area with reported H5N1 virus infection in poultry or a human case in the past month OR
- Close contact with an animal other than poultry that has been confirmed to be infected with H5 disease, such as pigs and cats
- Holding or handling human or animal lab specimens of H5N1 virus
- Patient with leucopenia
- X-ray findings of rapidly progressing pneumonia
- H5 antibody titer on HI test using horse erythrocytes or ELISA for influenza A unsubtyped.
DATA COLLECTION FORMS

• ILI:
  – ILI Case Form
  – Specimen Collection & Delivery Form
  – Weekly Aggregate Form

• SARI:
  – SARI Admission Form
  – SARI Discharge Form
  – Specimen Collection & Delivery Form
  – Weekly Aggregate Form
All data are collated and entered into the online system designed by the provincial health office for disease surveillance.
### Online ILI Case Form

**PEMASUKAN FORMULIR SURVEILANS SEVERE ACUTE RESPIRATORY INFECTION (SARI)**

**Nama Rumah Sakit**: [Name of Hospital]

**Tanggal Lahir**: [Date of Birth]

**Jenis Kelamin**: [Gender]

**Umur**: [Age]

**Alamat**: [Address]

**Keterangan**: [Remarks]

### Online Weekly Aggregate Form

<table>
<thead>
<tr>
<th>No</th>
<th>Kelompok Umur</th>
<th>Kasus SARI</th>
<th>Total Rawat Inap di RS (Termasuk kasus SARI)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 &lt; 1 Tahun</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 1 - 4 Tahun</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 5 - 9 Tahun</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4 10 - 14 Tahun</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5 15 - 19 Tahun</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6 20 - 44 Tahun</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>7 45 - 54 Tahun</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8 55 - 59 Tahun</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>9 60 - 65 Tahun</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>10 &gt;= 70 Tahun</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Online Lab Result**

### Identitas
- **Nama Pasien:** Arlin
- **ID Pasien (stiker):** E-12345
- **Tanggal Lahir:** 01 Februari 1944
- **Jenis Kelamin:** Laki-laki
- **Umur:** 60 Tahun
- **Alamat:** Angkasa No. 2 RT 7 RW 6
- **Kota:** Jakarta Pusat
- **Kecamatan:** Gambir
- **Kelurahan:** PETOO UTRAA

### Sampel yang Diajukan

<table>
<thead>
<tr>
<th>No</th>
<th>Jenis Specimen</th>
<th>Tanggal Pengambilan</th>
<th>Jari</th>
<th>Nama Pengambil Sampel</th>
<th>Ke</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sedih Hidung</td>
<td>01 Mei 2011</td>
<td>4</td>
<td>Marjimri Sumpah</td>
<td>Lab. KS Prof. Subanti Saroso</td>
</tr>
<tr>
<td>2</td>
<td>Lainnya</td>
<td>02 Mei 2011</td>
<td>6</td>
<td>Testing</td>
<td>Lab. KS Post. Gubi Saroso</td>
</tr>
</tbody>
</table>

### Hasil Laboratorium
- **Tanggal spesimen diterima:** 14 Maret 2011

#### Hasil
- **Reaksi diuji:**
  - HASIL NEGATIF
  - HASIL POSITIF
- **Parameter:**
  - Patof A: Tidak tahu
  - Patof B: Tidak tahu
  - Patof 209 (H1): Tidak tahu
  - Patof H1: Tidak tahu
  - Patof HD: Tidak tahu
A key feature of the online reporting system is that each sentinel site can directly view their own data, including summary weekly and cumulative reports.
SURVEILLANCE RESULTS

AUGUST 2011 – MAY 2012
Of the total 49,864 admissions, 3% (n=1,537) were SARI patients. The overall proportion of admissions identified as SARI patient ranged from 2% to 6%, where the peak in SARI activity was detected in week 2, 2012 (6%).
Of the total 1,477 specimens tested, 17% (n=255) were influenza positive. The proportion of specimens found positive for influenza started to increase in week 49, 2011 and reached the peak in week 6, 2012 with 36% of SARI cases confirmed as influenza. The proportion of influenza positive remains high compared to October-November 2011.
Of the total 134,967 visits, 2% (n=2,929) were ILI patients. The overall proportion of outpatient visits identified as ILI patients were 1% to 4% where peaks in ILI activity were detected in weeks 6 - 8, 2012; but started to decrease in week 9, 2012.
Of the total 2,873 specimens tested, 39% (n=1,111) were influenza positive. The proportion of specimens found positive for influenza started to increase to 60% in week 52 (2011) and reached the peak at 76% in week 3 (2012). The proportion of influenza positive among ILI patients remained high in the early weeks of 2012 but started to decrease by week 15.
Influenza A viruses accounted for the majority of viruses detected among ILI and SARI influenza-positive patients. By subtype, a large number of pandemic 2009 A(H1) viruses were detected in late 2011. Influenza A (H3) dominated in early 2012, but influenza B then dominated in March 2012 onwards.
The virological patterns observed in the East Jakarta project mirror the patterns found in the national sentinel surveillance system (run through NIHRD, MOH). In this national system, influenza A (H3) dominated in early 2012, but influenza B then dominated in week 10, 2012 onwards.
Poultry exposure history in the 7 days before illness onset for persons enrolled in ILI and SARI surveillance: August 1, 2011 – March 31, 2012

<table>
<thead>
<tr>
<th>Poultry Exposure</th>
<th>SARI Patients (N=1,359)</th>
<th>ILI Patients (N=2,597)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of cases</td>
<td>%</td>
</tr>
<tr>
<td>Contact healthy poultry</td>
<td>69</td>
<td>5</td>
</tr>
<tr>
<td>Contact sick poultry</td>
<td>11</td>
<td>1</td>
</tr>
<tr>
<td>Contact dead poultry</td>
<td>3</td>
<td>0.2</td>
</tr>
<tr>
<td>Contact poultry products</td>
<td>69</td>
<td>5</td>
</tr>
<tr>
<td>Slaughtered or cleaned poultry</td>
<td>21</td>
<td>2</td>
</tr>
<tr>
<td>Contact with chicken manure</td>
<td>33</td>
<td>2</td>
</tr>
</tbody>
</table>

Very few ILI & SARI cases had contact with sick or dead poultry: 24 of 3,956 (0.06%)
SIGNIFICANCE OF FINDINGS

• All ILI or SARI cases tested negative for H5 despite ongoing circulation of H5N1 virus in poultry. This is based on findings from routine H5N1 virus surveillance in 80 live bird markets in the greater Jakarta area. This suggests that H5N1 infection in this community is rare.

• System demonstrates capacity to monitor influenza trends and mirrors findings from the national sentinel surveillance system for ILI and SARI (NIHRD).
Strategies for Success

• System quality, timeliness and completeness is maintained through monthly monitoring missions to each hospital and health center participating in the surveillance system.

• Laboratory quality is maintained through regular refresher trainings to technicians & practical SOPs that maximize quality control.

• Clear operational SOPs have been written & provided to each sentinel site.

• High commitment from provincial & district level authorities (participate monitoring missions & quarterly evaluation meetings).

• Active provision and monitoring of supplies and logistics, including daily collection/transfer of specimens from sites to labs.
Strategies for Success 2

• System enables rapid feedback to participating sites for lab results (within 2 days).

• System uses real-time online reporting & descriptive data analysis.

• System strengthens capacity of local labs to participate in disease surveillance.

• The activities integrates the work of various teams & partners (including logistic support).
PARTNERS

• Jakarta Provincial Health Office
• East Jakarta District Health Office
• Jakarta Provincial Laboratory
• Sulianti Saroso Hospital Lab
• NIHRD, MOH
• Animal Health Directorate, Ministry of Agriculture
• Jakarta Provincial Livestock Office
• Jakarta Provincial Veterinary Laboratory

• U.S. CDC
• WHO
• FAO
• USAID
• USAID|Deliver
• REDI Center
NEXT STEPS

• The project will continue for one more year at least to monitor trends over time.

• Surveillance inputs should involve more local resources.

• Collaboration with District Agriculture Office to strengthen interface between human-animal surveillance, and to determine likely time periods that human H5N1 cases could be detected in the district.

• Future work from this project will assess seasonal influenza disease burden. This includes a health utilization survey (HUS), which can identify proportion of population seeking care for respiratory illness at surveillance sites, provide denominators for rate calculations & provide data on health-seeking behaviour.